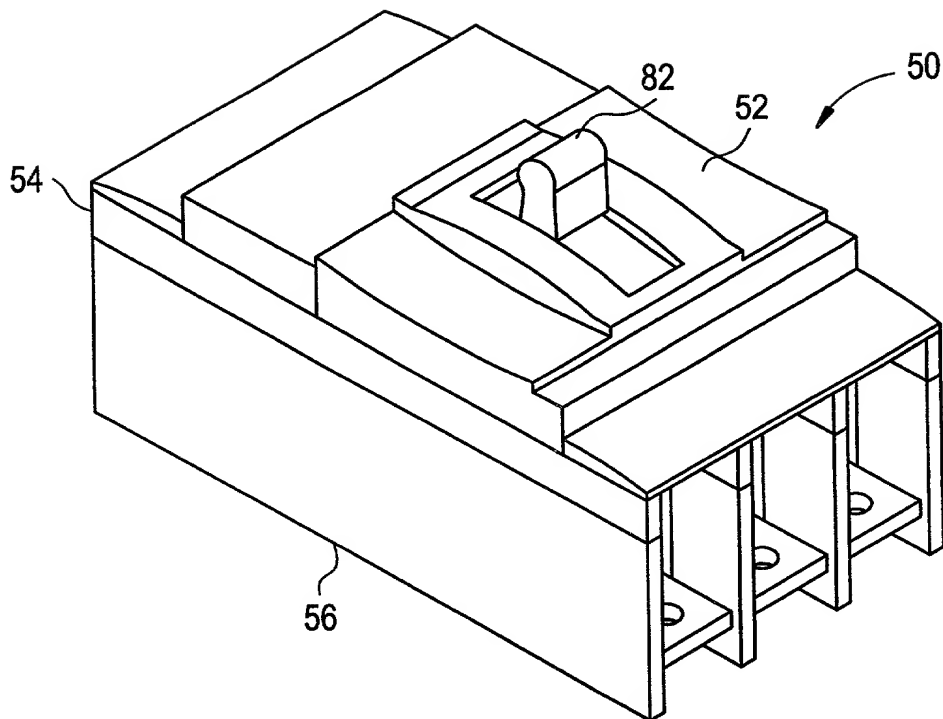


FIG. 1



09/918,993 "01.10.02"

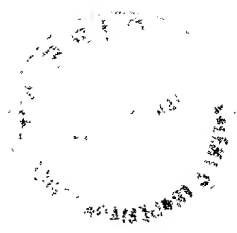
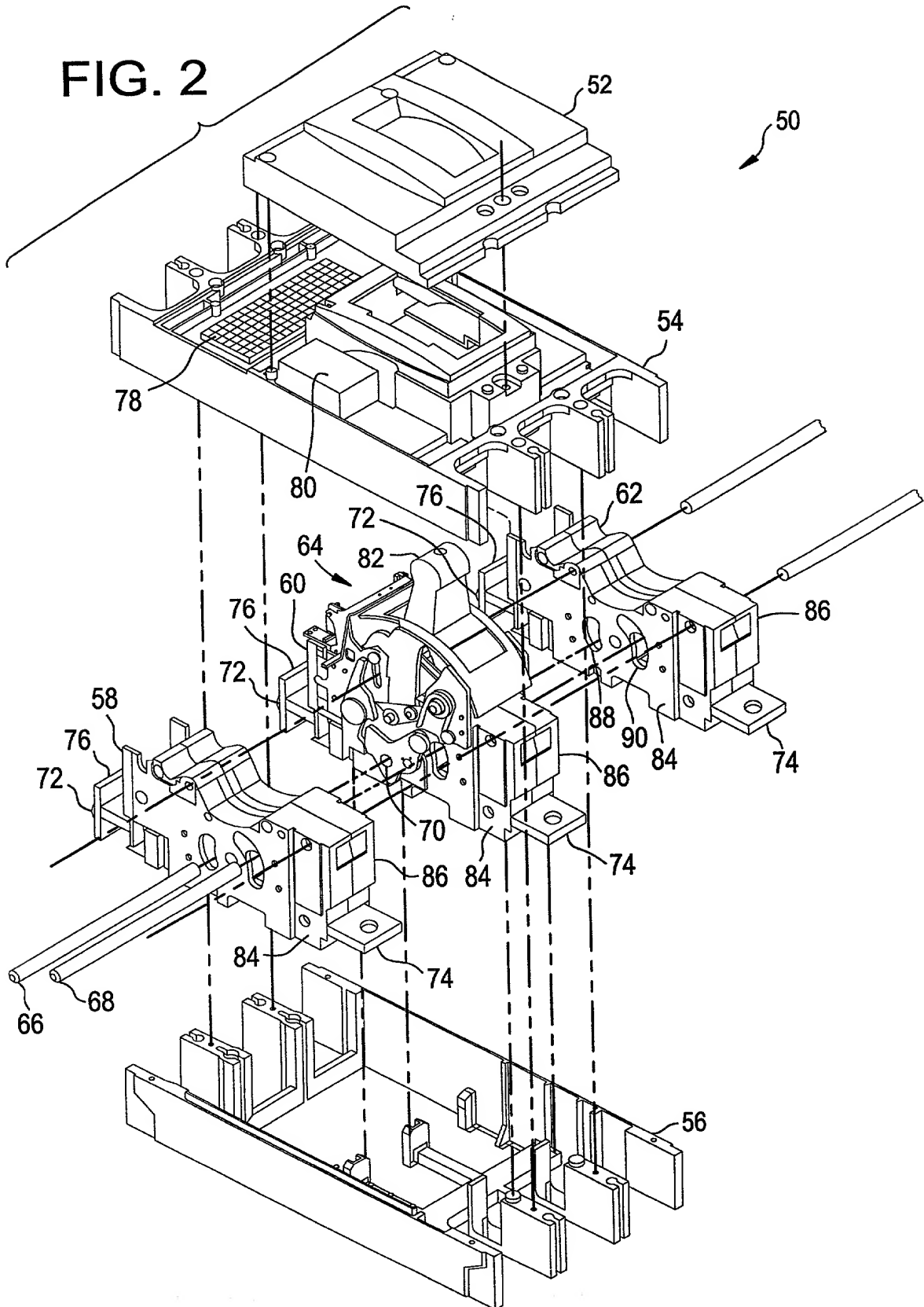


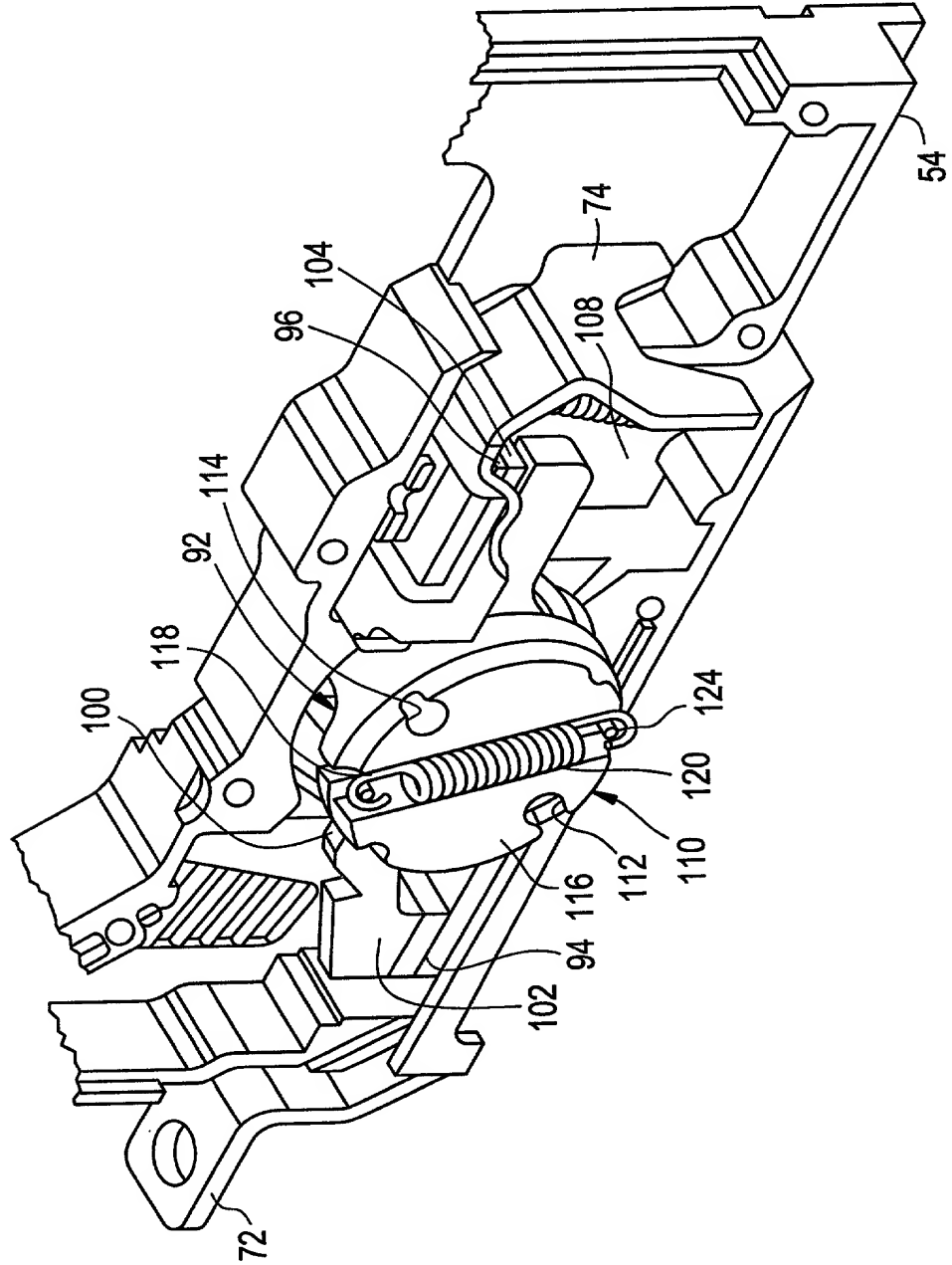
FIG. 2



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FIG. 3



[illegible]

FIG. 5

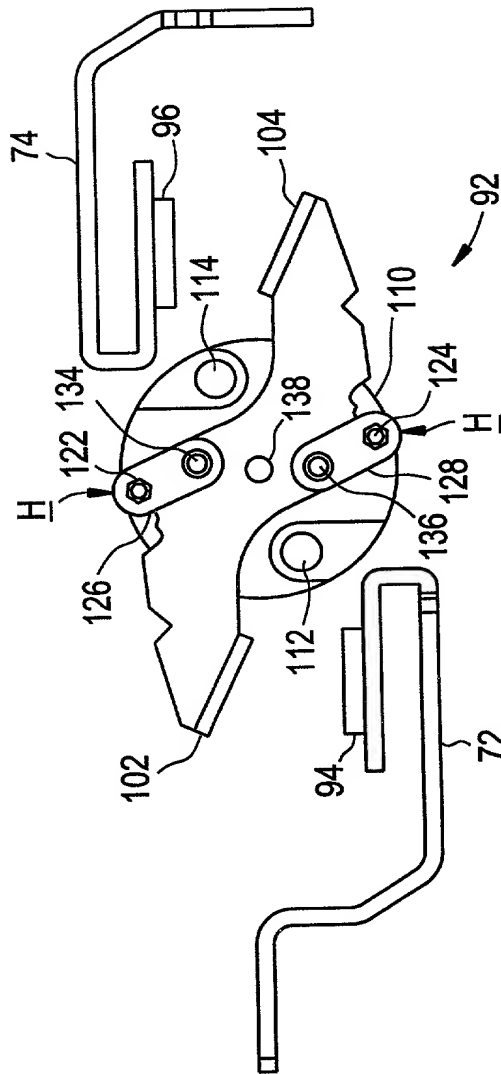
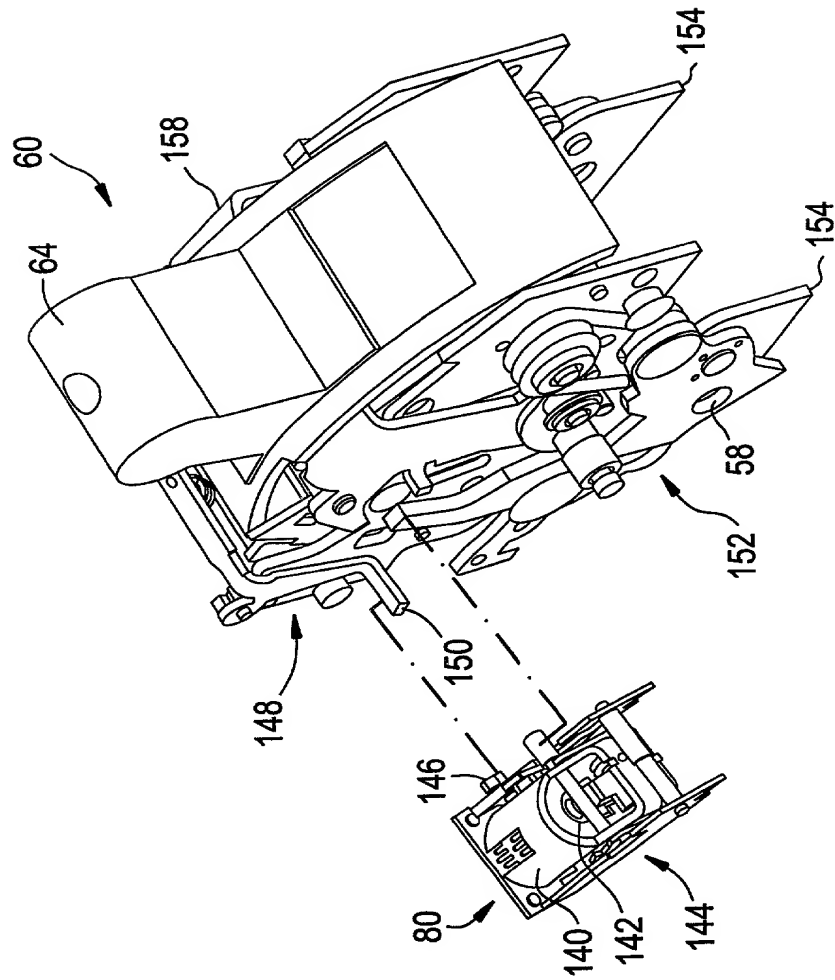
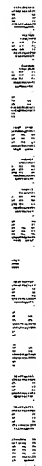


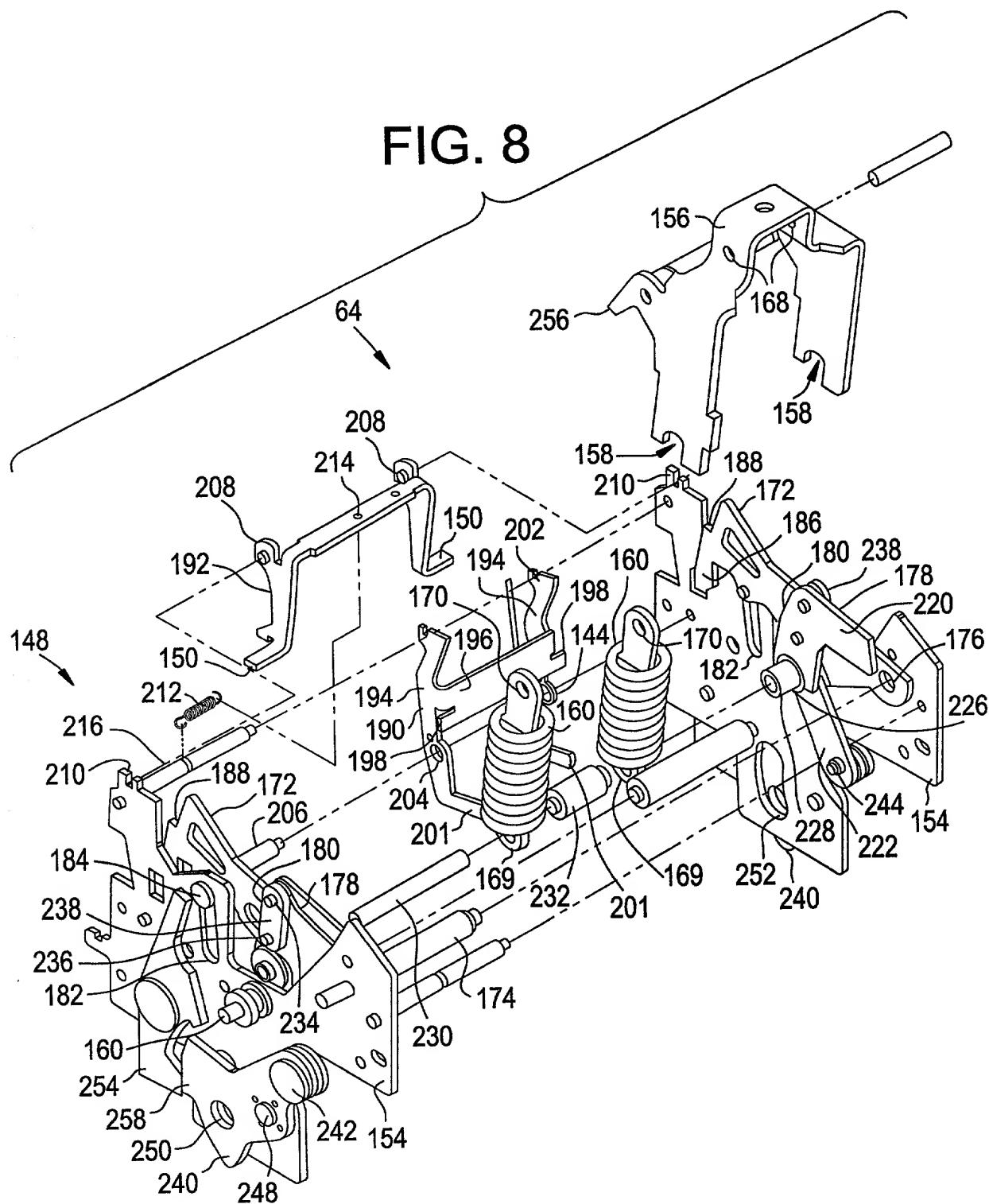
FIG. 6





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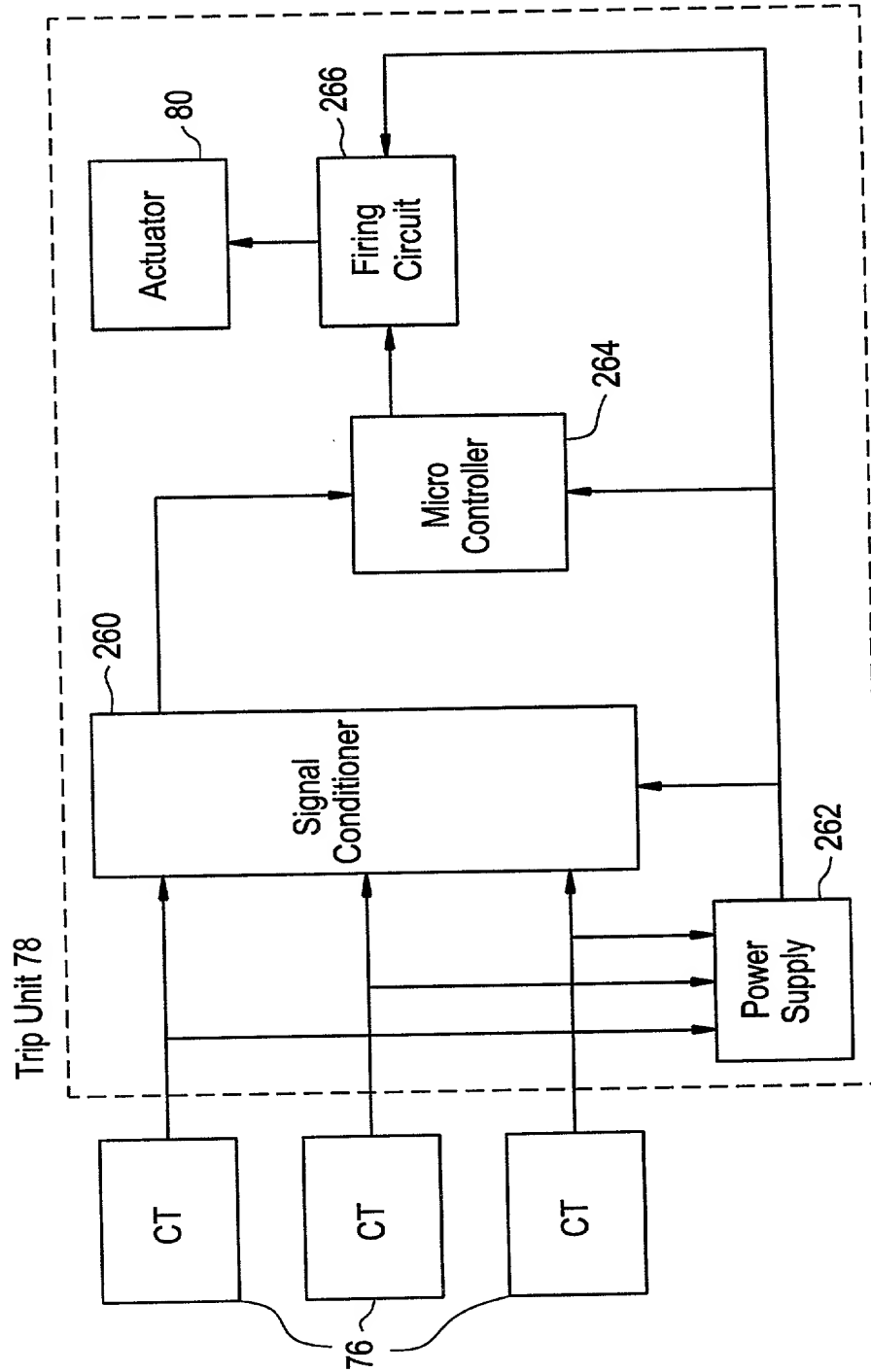
FIG. 8



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FIG. 9



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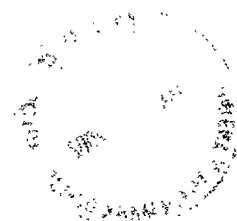
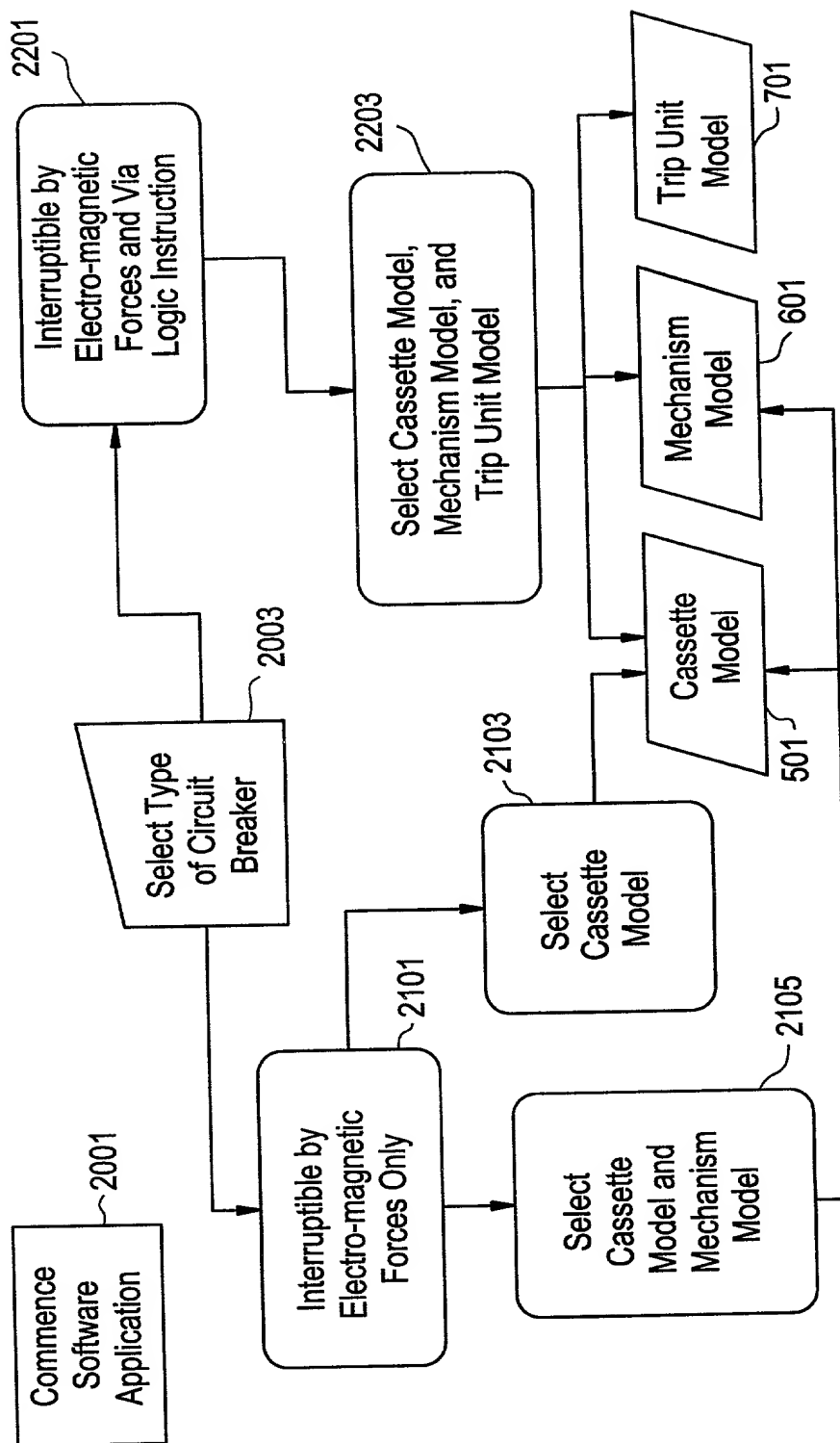


FIG. 10



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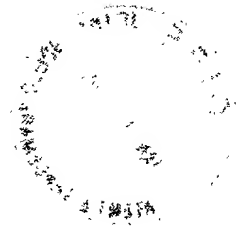
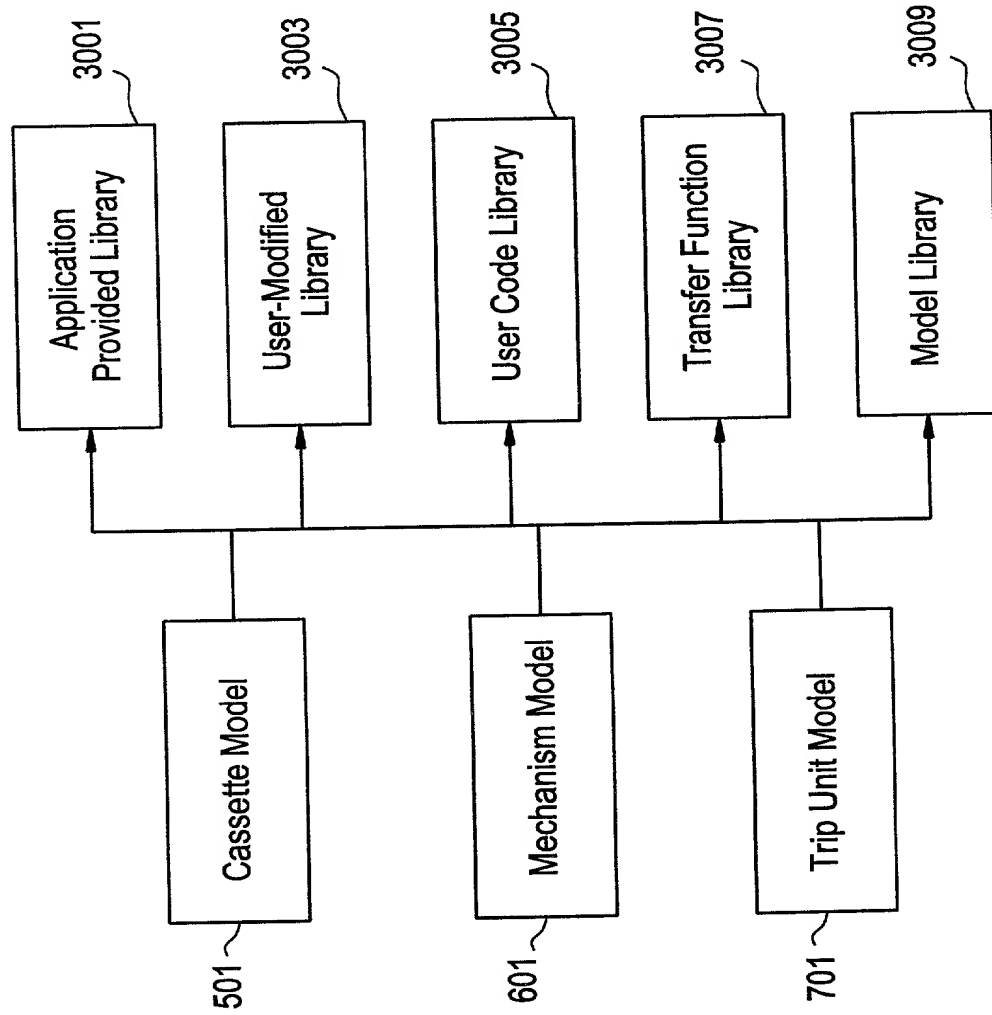
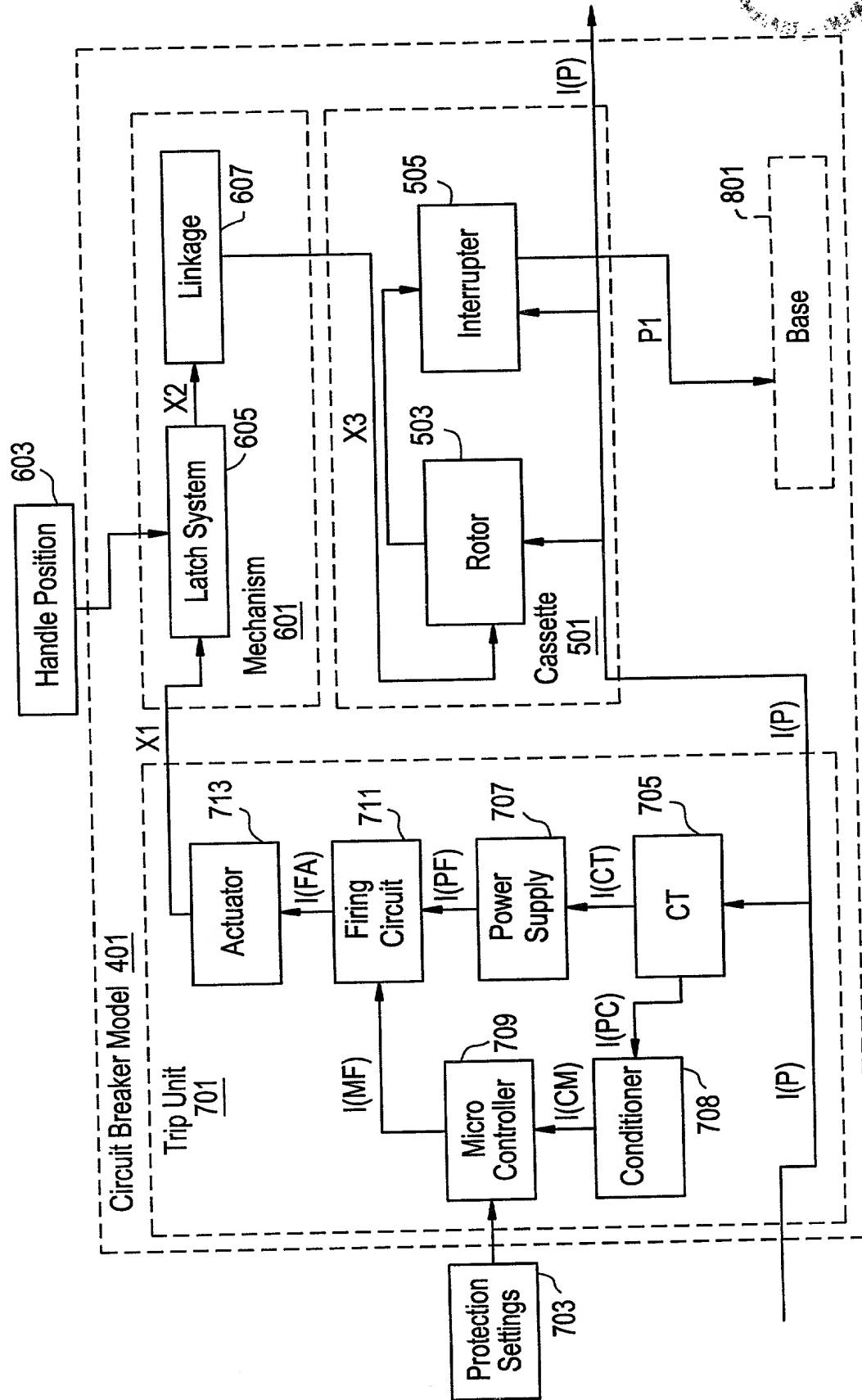


FIG. 11



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FIG. 12



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FIG. 13

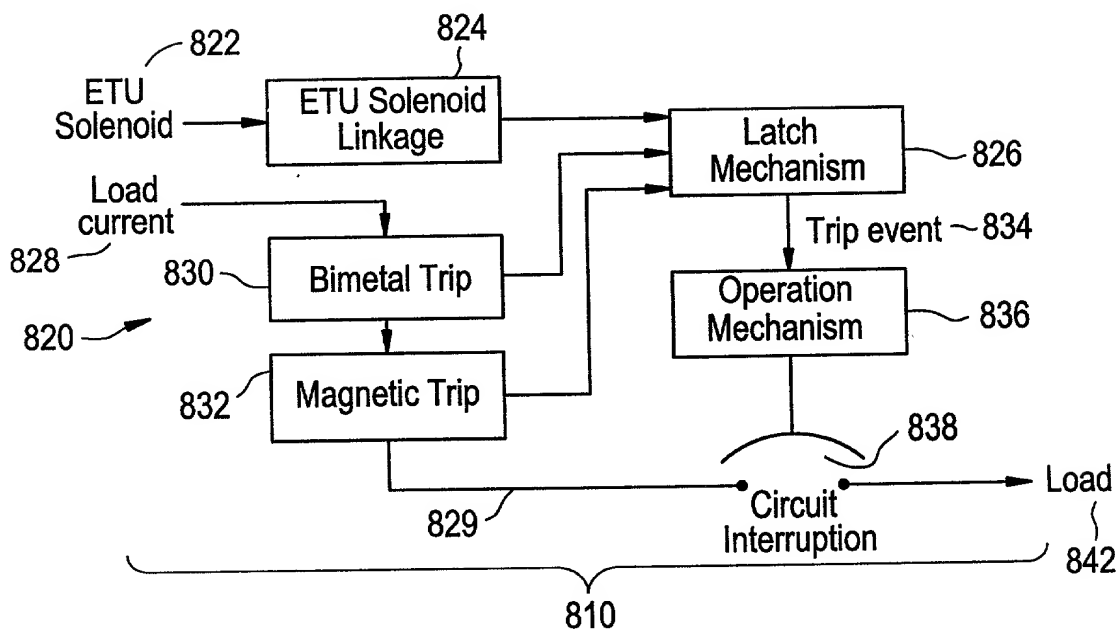
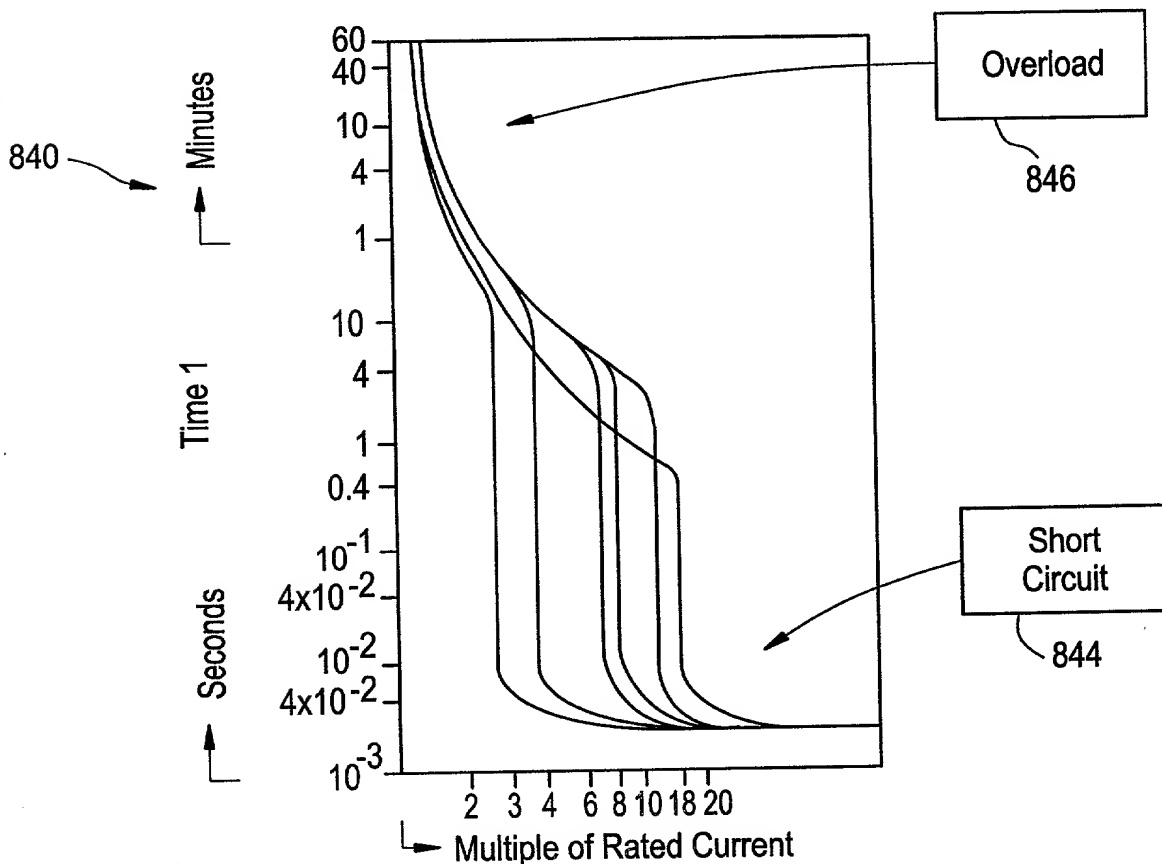


FIG. 14



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FIG. 15

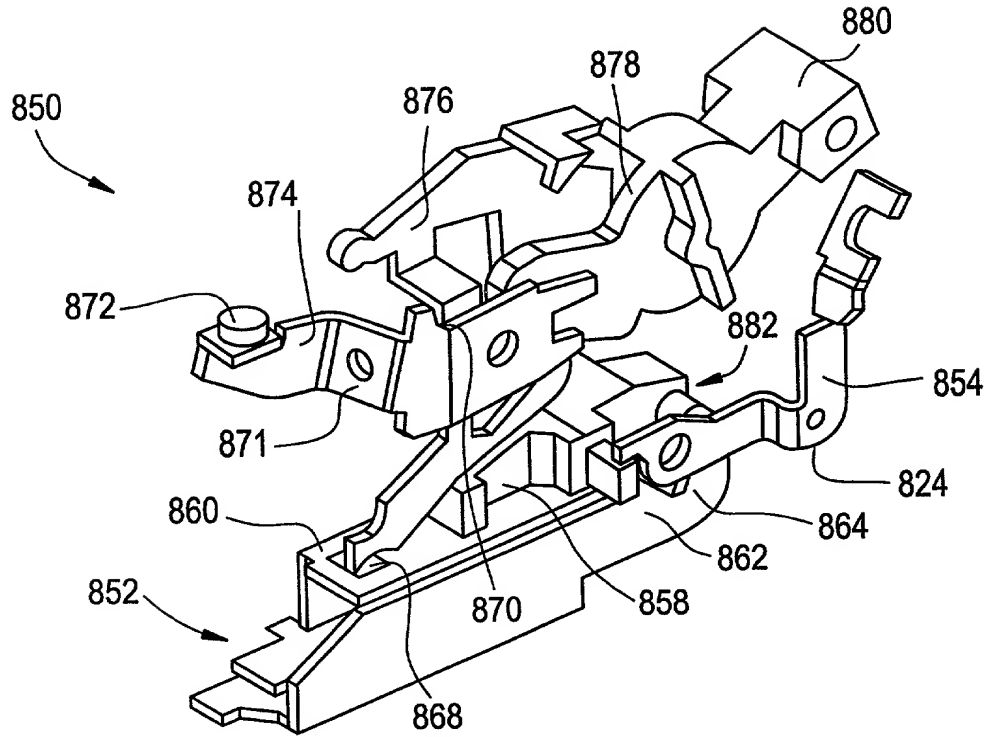


FIG. 16

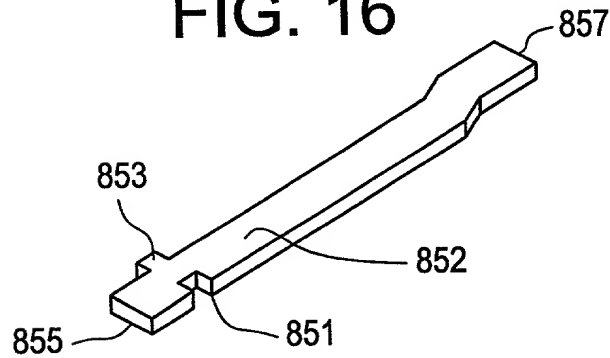


FIG. 17

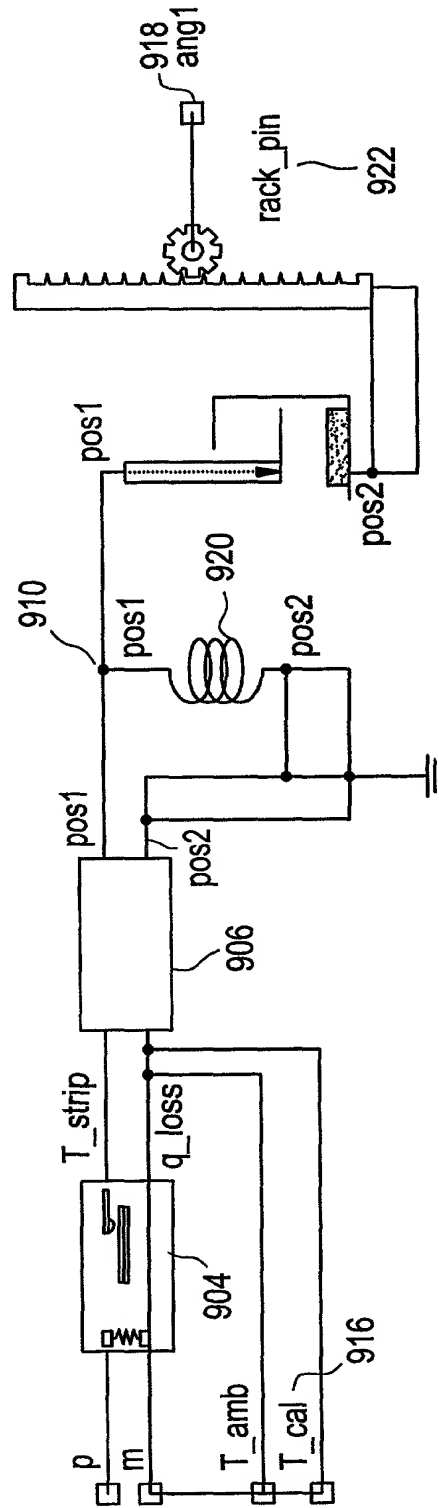


FIG. 18

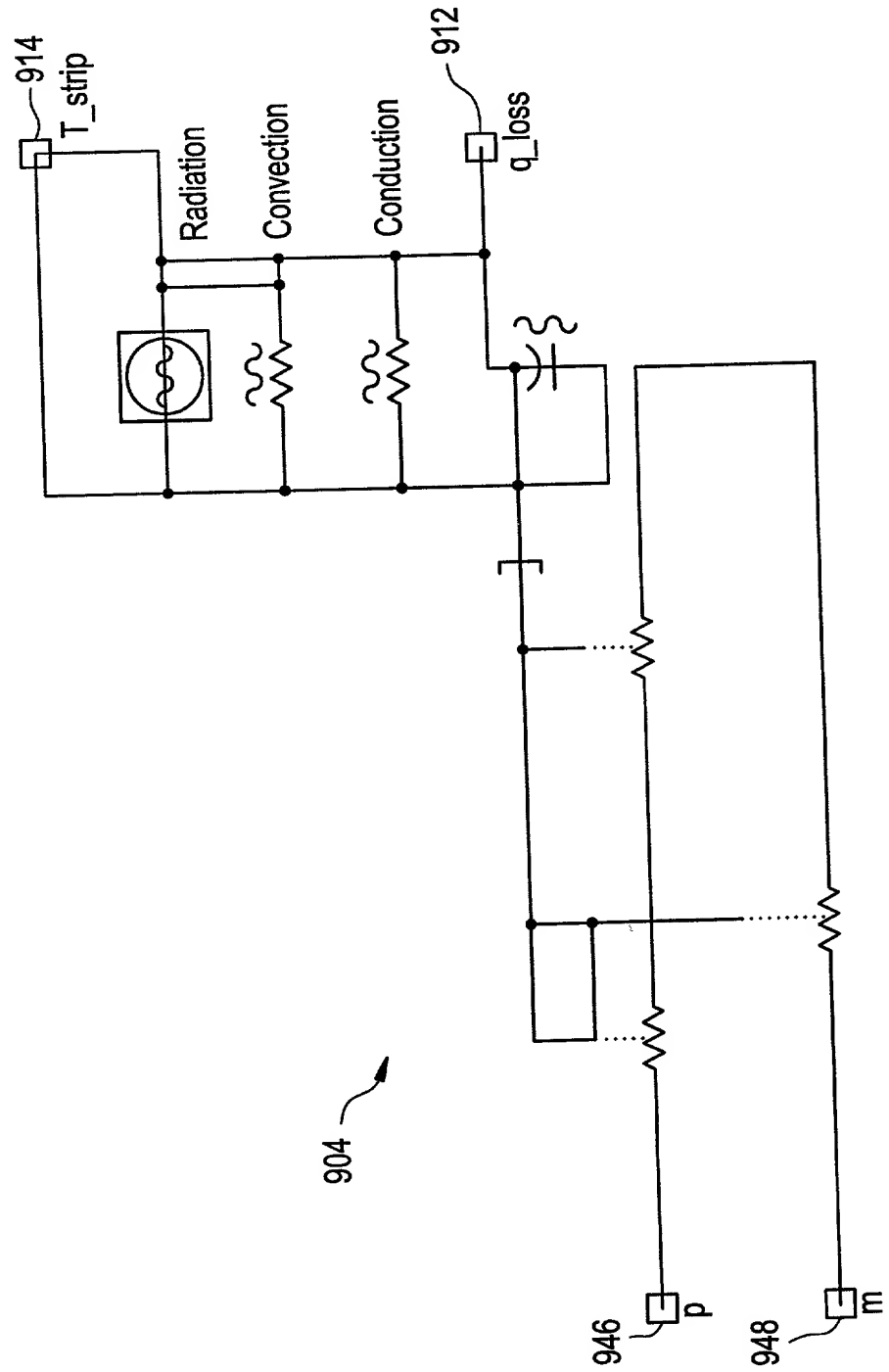


FIG. 19

906

```
values {  
    deltaT = tc(th) - tc(tl)  
    Pout = F_s*deltaT*E_s*w_s*t_s*t_s /  
           (4 * l_s) * 4.24358  
}  
equations {  
    # no input heat flow  
    p(th->tl) += 0  
    # output force  
    frc_N (pos1->pos2) += Pout  
}
```

FIG. 20

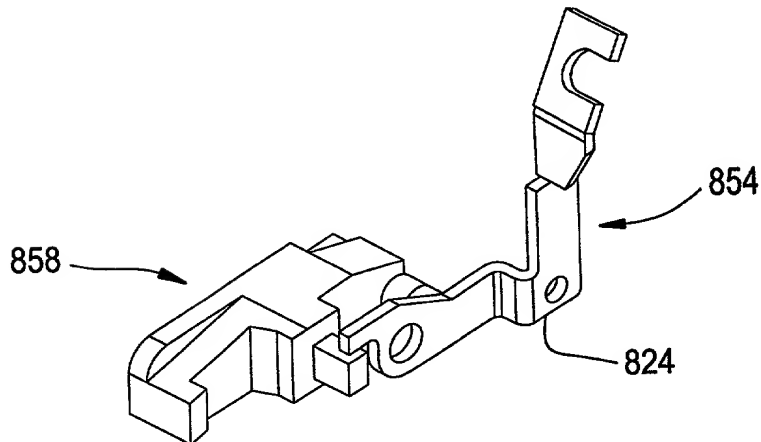
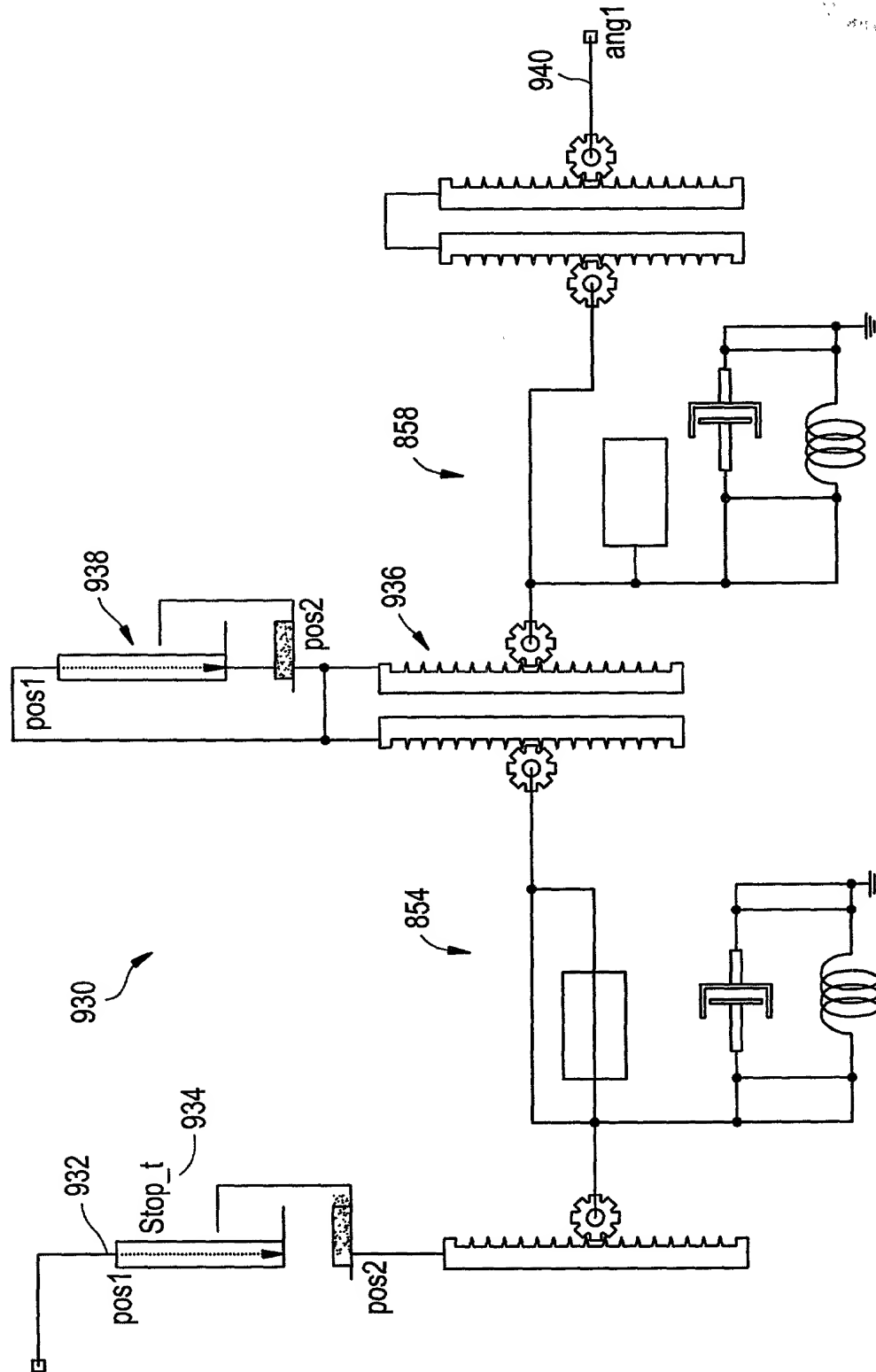
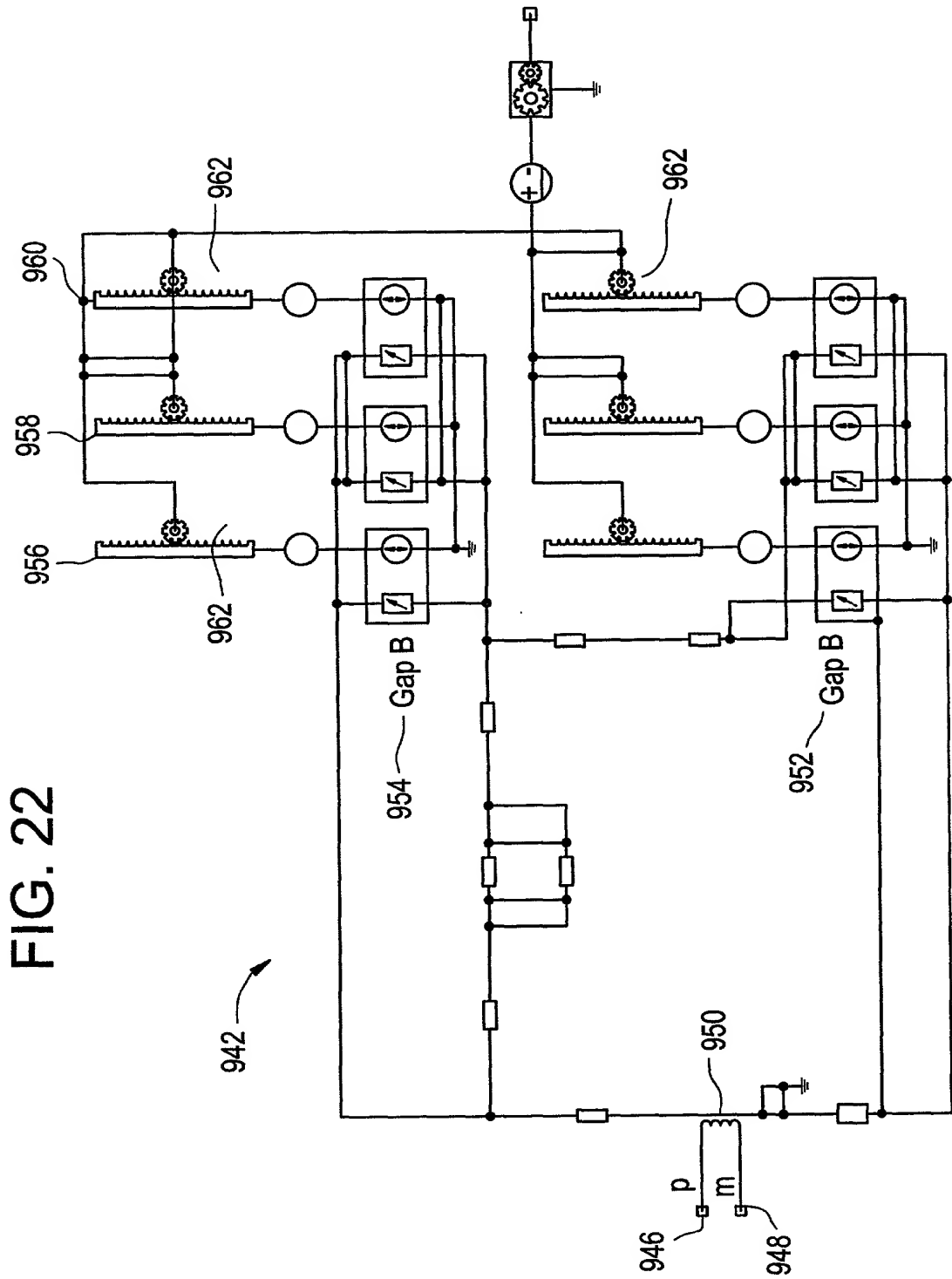


FIG. 21



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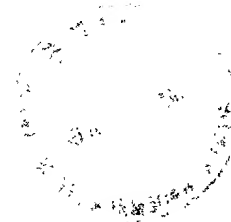


FIG. 23

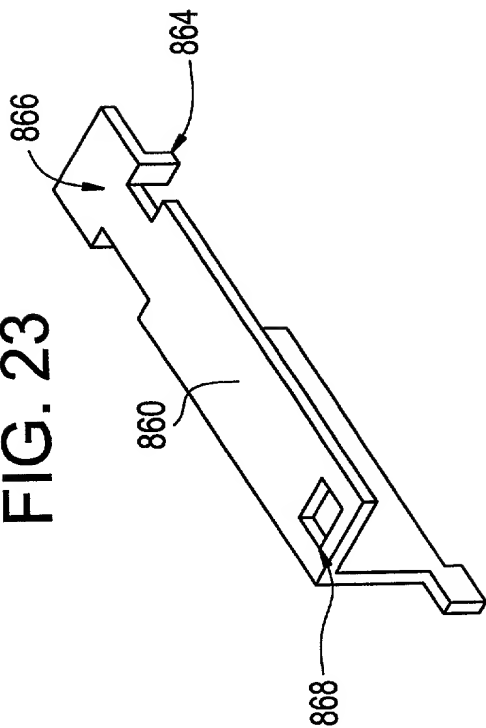


FIG. 25

972

latch_pos. sin
code_snippet

values {

delta = pos_m(pos1)

theta_op = ang_rad(ang1)

if (delta > threshold) tq_out = 0

else tq_out = on_torque + slope + (threshold - delta)

if the operating arm is already unlatched, no torque output possible.

if ((time > lu) & (theta_op < -5m)) tq_out = 0

}

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FIG. 24

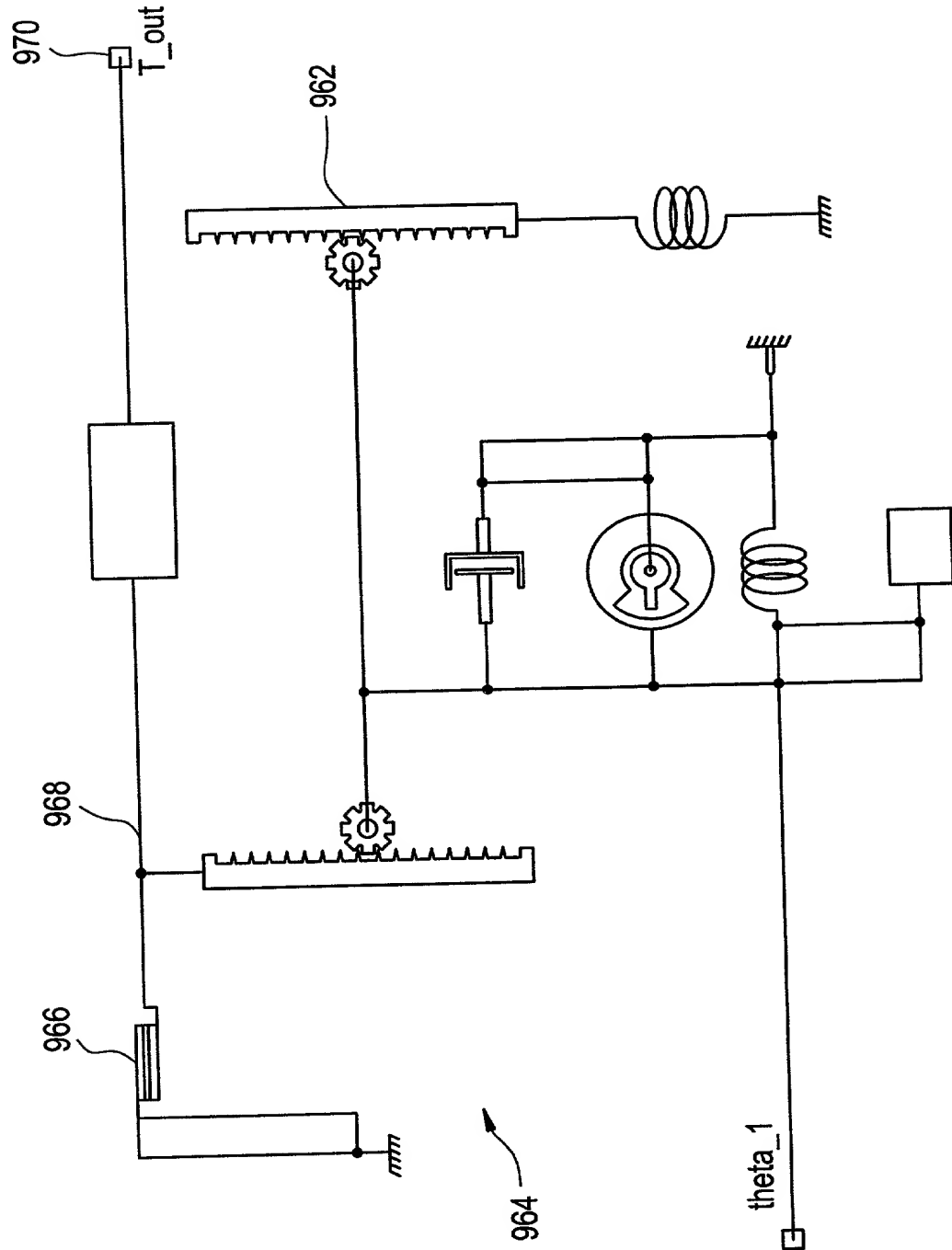


FIG. 26

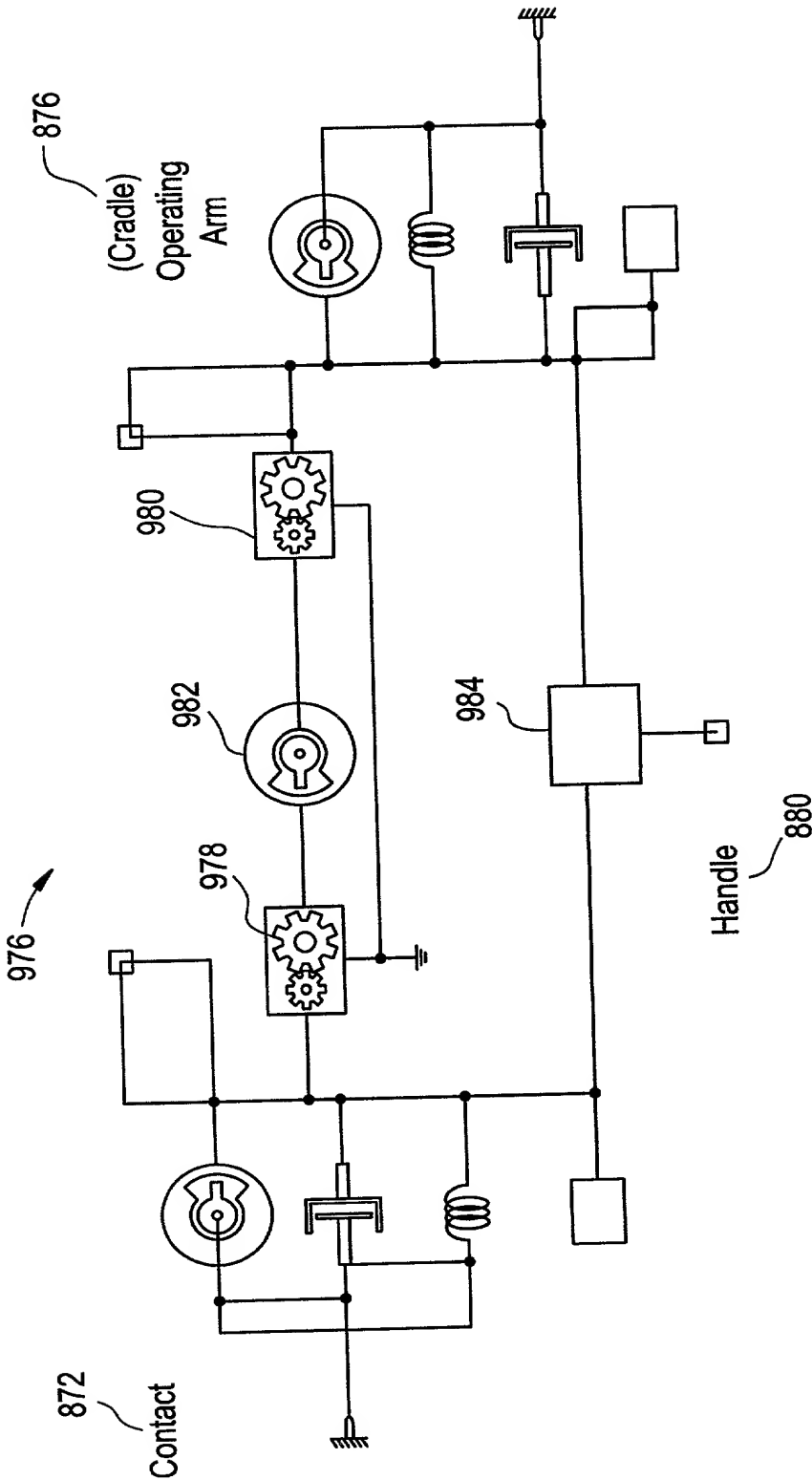


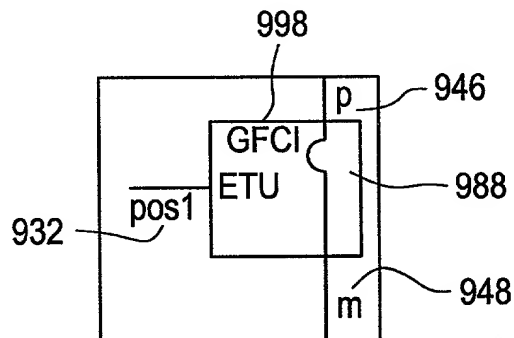
FIG. 27

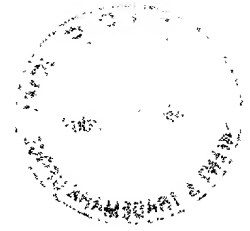
```

spring_coupling.sin
code_snippet      —984
values {
    theta_c = ang_rad (ang1)
    theta_op = ang_rad (ang2)
    theta_h = ang_rad (ang3)
    x_cp = r_h * cos (theta_h + phi_h) + x_off_h
    y_cp = r_h * sin (theta_h + phi_h) + y_off_h
    x_op = r_op * cos (theta_op + phi_op) + x_off_op
    y_op = r_op * sin (theta_op + phi_op) + y_off_op
    x_c = r_c * cos (theta_c + phi_c) + x_cp
    y_c = r_c * sin (theta_c + phi_c) + x_cp
    deltax = x_op - x_c
    deltax = y_op - y_c
    delta = sqrt (abs(deltax * deltax + deltay * deltay1)
    x_spring_f = k * (delta - deltaC) * deltax / delta
    y_spring_f = k * (delta - deltaC) * deltay / delta
    # Calculate spring torque applied to each member - use normal radial distances to
    # spring force components.
    tq_op = x_spring_f * r_op * sin(theta_op + phi_op) + -1 * y_spring_f * r_op * cos (theta_op +
    phi_op)
    tq_c = -1 * x_spring_f * r_c * sin(theta_c + phi_c) + y_spring_f * r_c * cos (theta_c + phi_c)
    }

```

FIG. 29





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FIG. 30

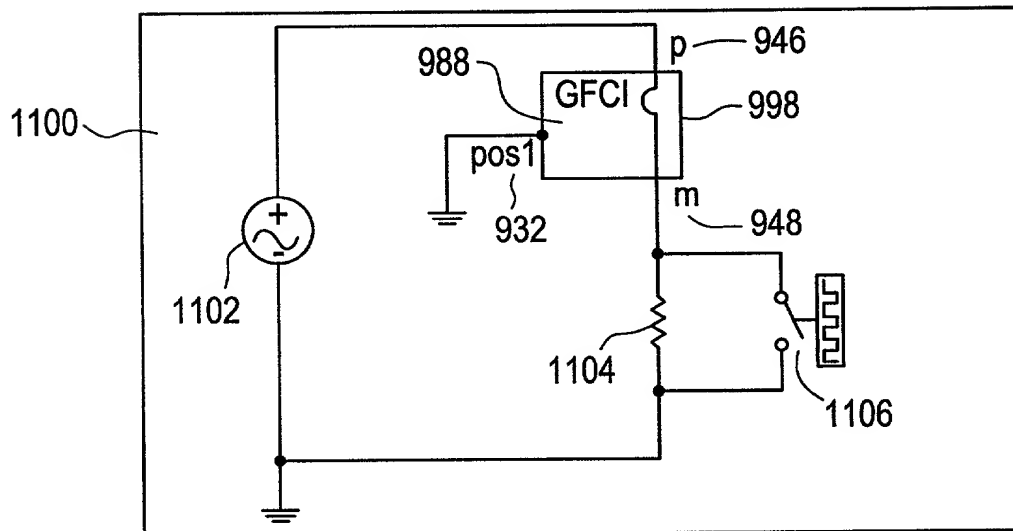


FIG. 31

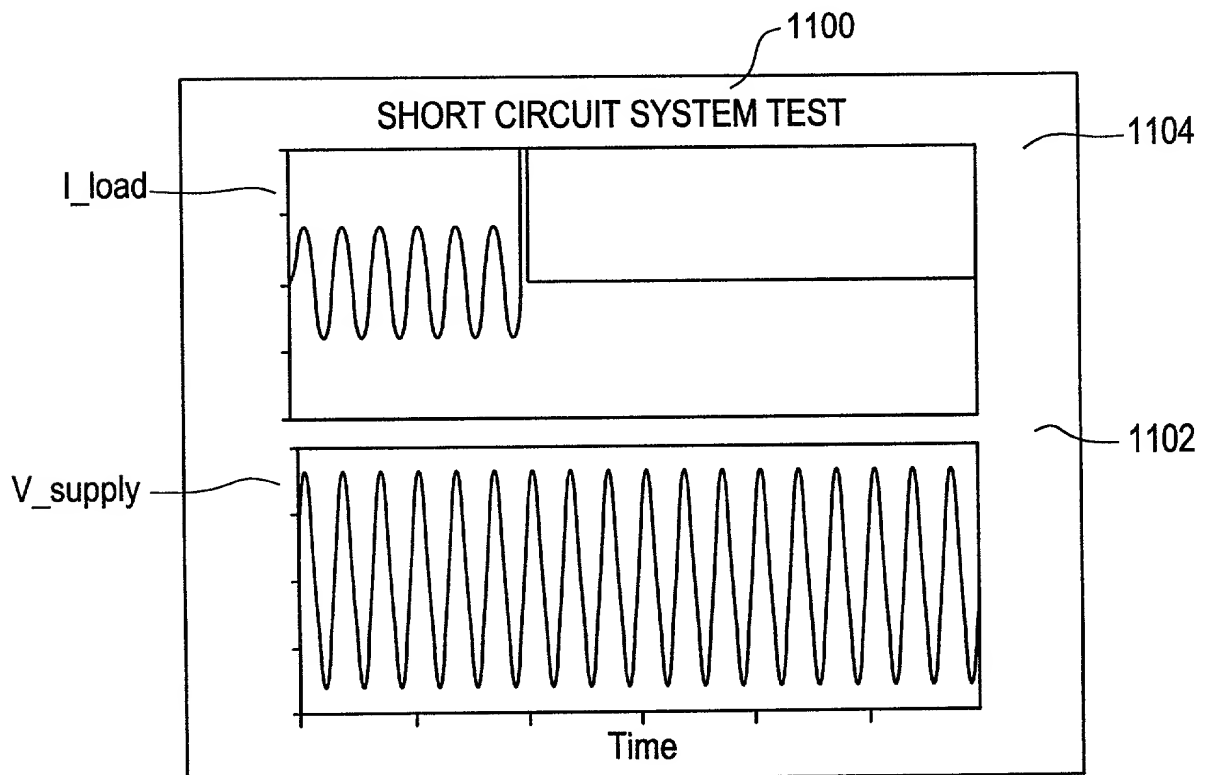


FIG. 32

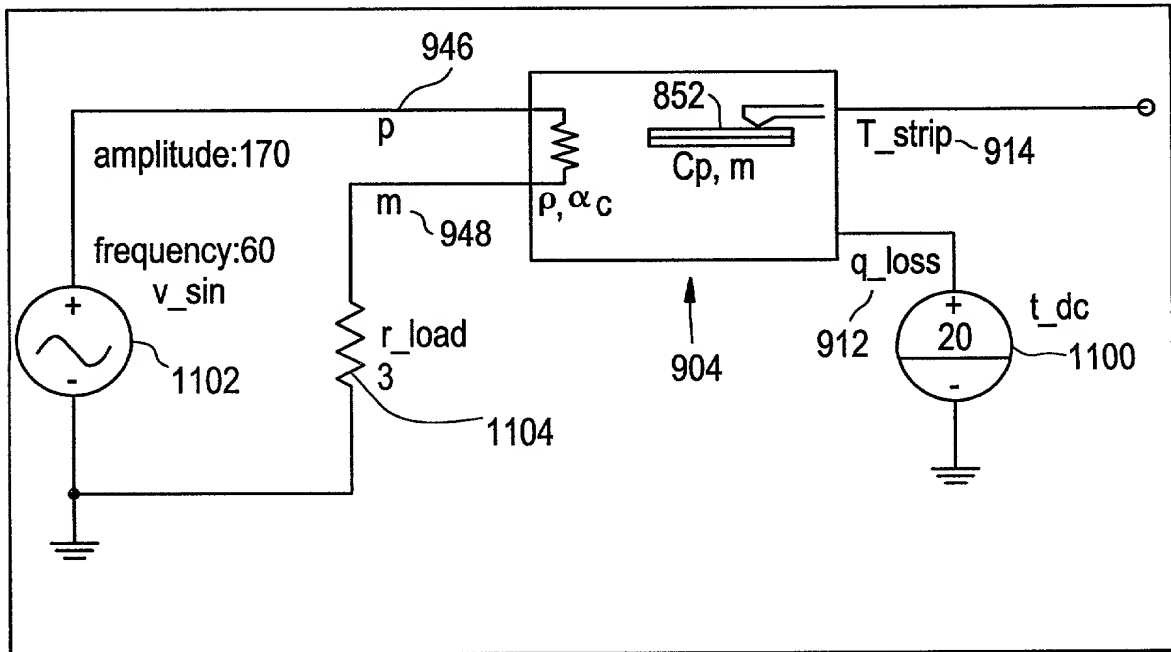
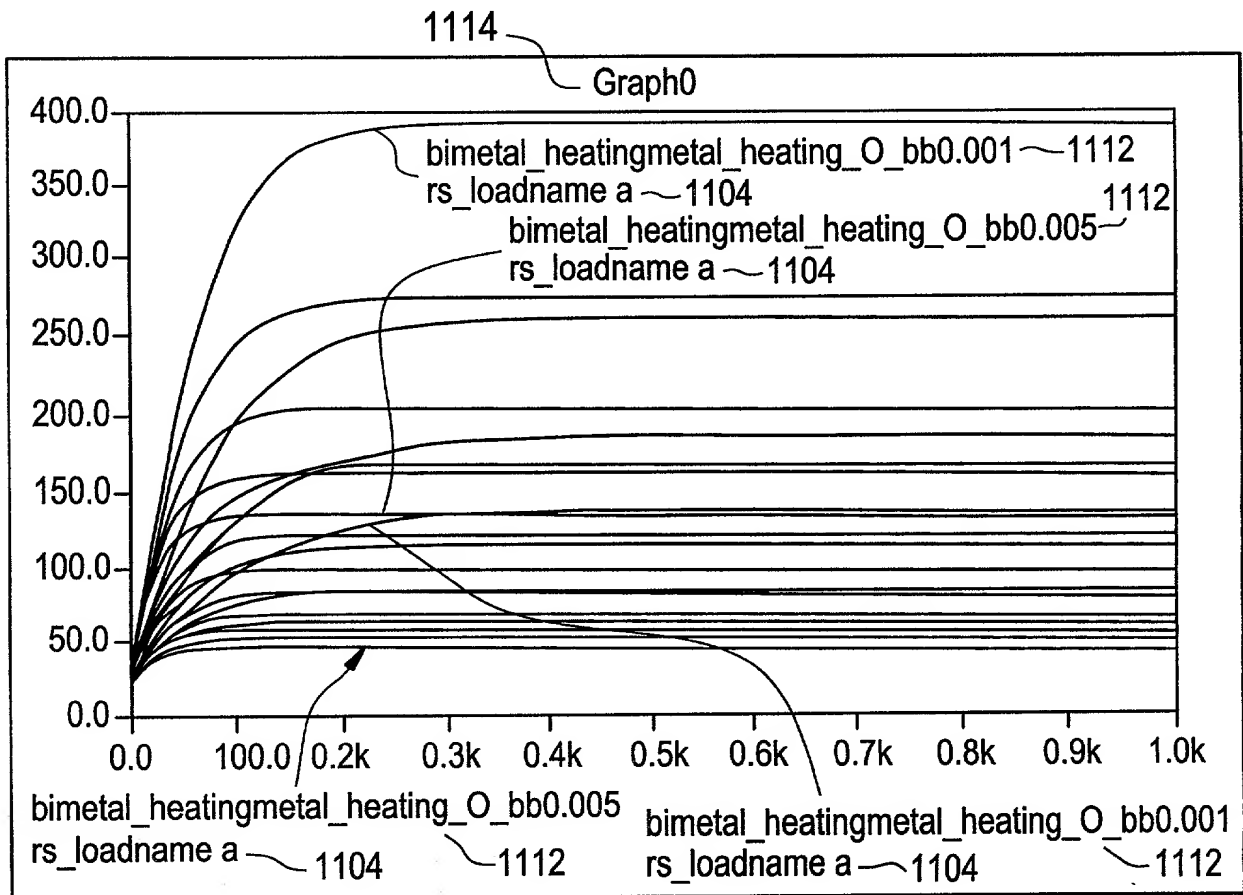


FIG. 33



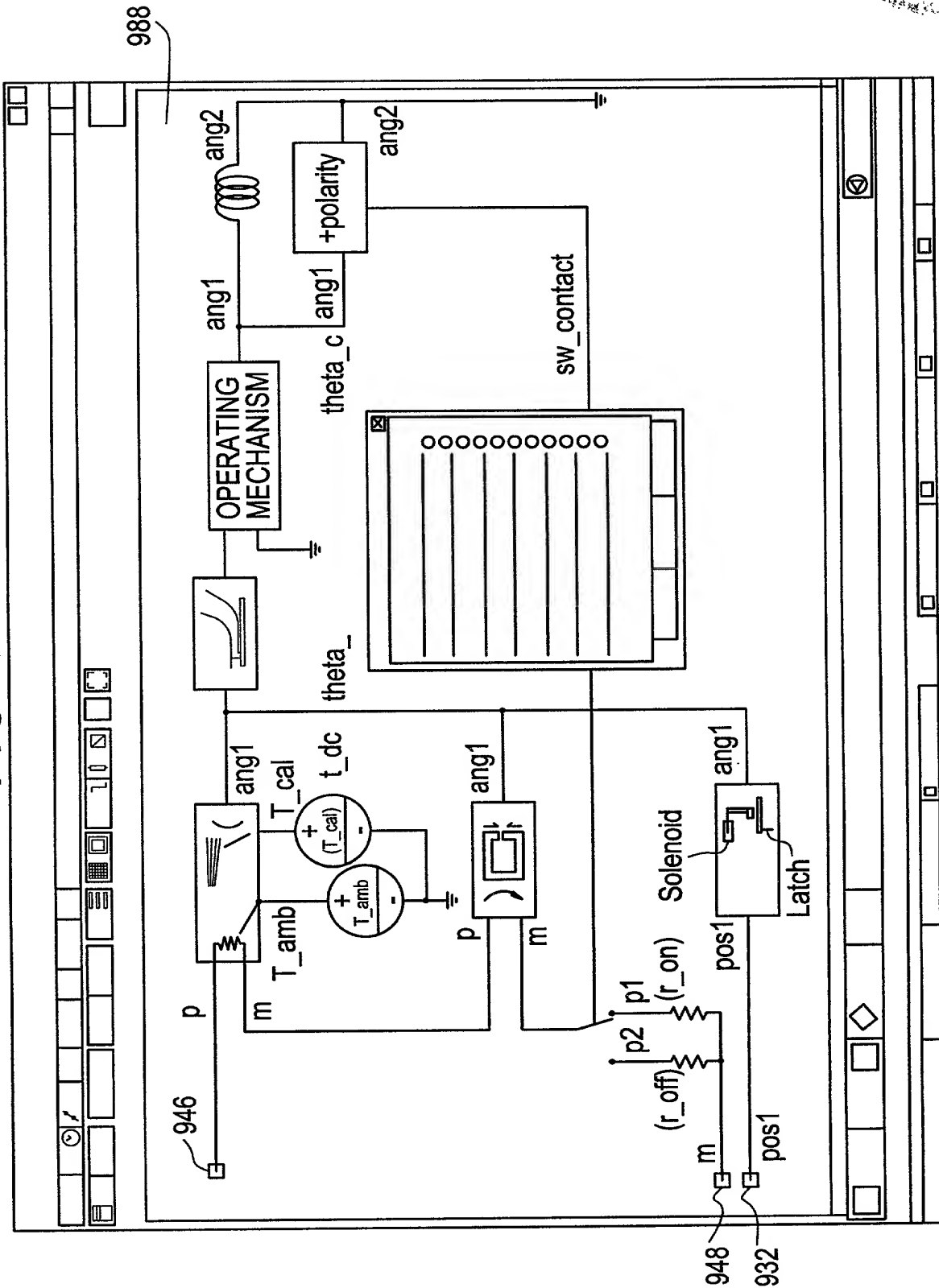
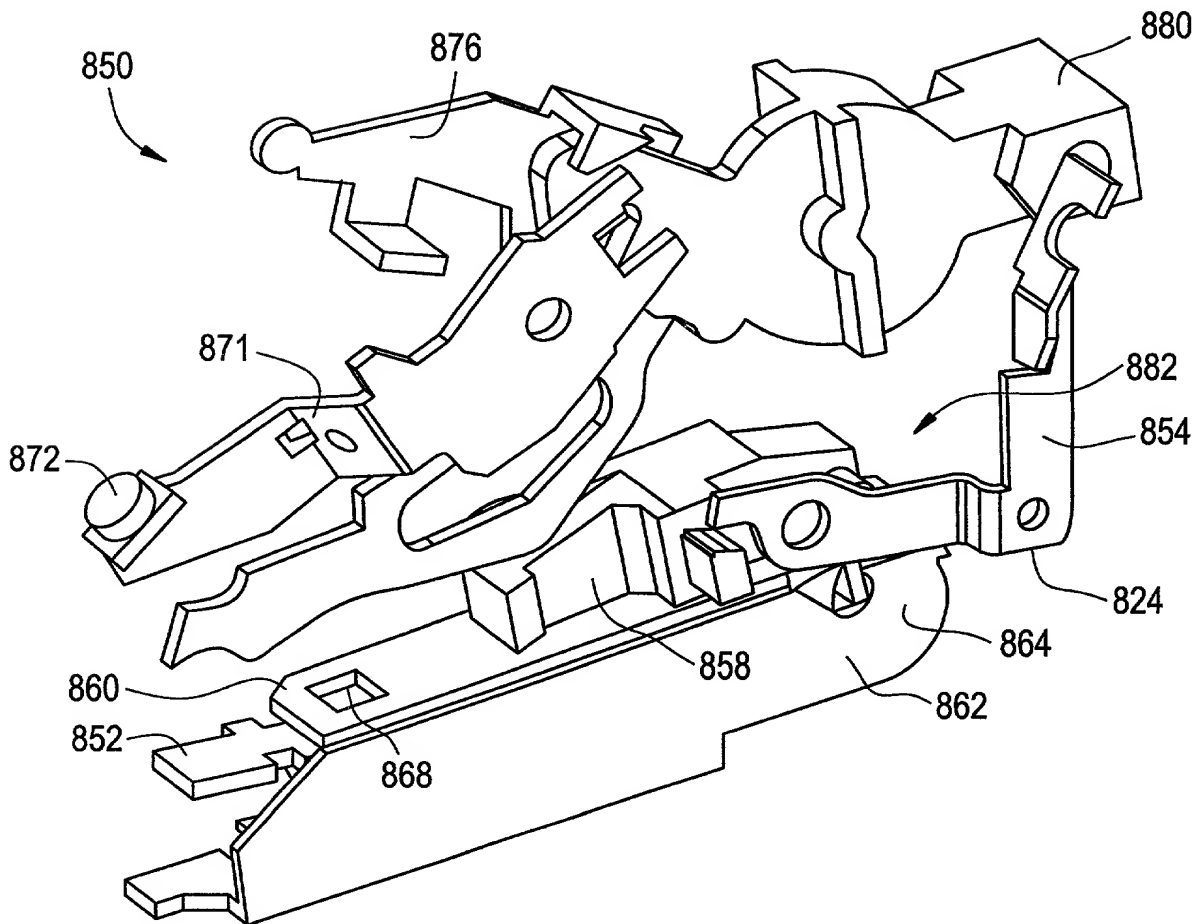
[illegible]



FIG. 35



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